Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for optically inspecting a sample, the method comprising:

illuminating the sample with an incident field and obtaining a resulting output field;

measuring the resulting output field to determine an optical response of the sample;

generating measurement parameters that correspond to the measured optical response by performing the following operations:

a) searching a database comprising pre-computed optical responses associated with sets of parameters to locate [[a]] the one pre-computed optical response that most closely matches the determined optical response,

b) interpolating, based on the said one pre-computed optical response and the parameter sets in the database, to generate an interpolated optical response that matches the determined optical response within a first defined termination criterion, and

c) iteratively evaluating a theoretical model to refine the interpolated optical response until the refined interpolated optical response matches the determined optical response within a second defined termination criterion and determining the measurement parameters therefrom.

2. (Original) A method as recited in claim 1 that further comprises the step of iteratively evaluating the theoretical model to generate the database.

3. (Original) A method as recited in claim 1 wherein the step of interpolating is performed without evaluating the theoretical model.

4. (Previously Presented) A method as recited in claim 1 wherein the database searching, database interpolation and iterative evaluation operations are performed in sequence to successively refine an optical response and determine the measurement parameters.

5. (Original) A method as recited in claim 1 wherein the database interpolation is performed using reduced multicubic interpolation.

6. (Original) A method as recited in claim 1 wherein the operations a, b and c are performed in order.

7. (Currently Amended) A device for optically inspecting a sample, the device comprising:

a measurement system for illuminating the sample with an incident field and generating a resulting output field, the measurement system operable to measure the resulting output field to determine an optical response of the sample;

a database including sets of sample parameters and associated pre-computed optical responses;

a processor for generating measurement parameters that correspond to the ~~measured~~ determined optical response, the processor configured to include:

a database searching module for searching [a] the database to locate a pre-computed optical response that best matches the determined optical response;

[[a]] an interpolated refinement module for interpolating based on the best matched pre-computed optical response and the parameter sets in the database to generate an interpolated optical response that more closely matches the determined optical response; and

a theoretical refinement module for iteratively refining the interpolated optical response using a theoretical model and ~~determining~~ generating the measurement parameters therefrom.

8. (Currently Amended) A device as recited in claim 7 wherein the database is generated by iteratively evaluating the theoretical ~~refinement~~ model.

9. (Currently Amended) A device as recited in claim 7 wherein the interpolated refinement module operates without evaluating the theoretical ~~refinement~~ model.

10. (Currently Amended) A device as recited in claim 7 wherein the database searching module, ~~database~~ the interpolation refinement module and ~~iterative evaluation operations are invoke~~ the theoretical refinement module are invoked in sequence to successively refine ~~an optical response and determine~~ the generation of measurement parameters.

11. (Currently Amended) A method of evaluating a sample comprising the steps of:

illuminating the sample with an incident field and generating a resulting output field;

measuring the resulting output field to determine a measured optical response of the sample;

searching within a database of pre-computed optical responses and associated sets of measurement parameters to locate the pre-computed optical response that most closely matches the measured optical response;

interpolating to refine the pre-computed optical response ~~obtained from the database~~ located in the database during the searching step and using the parameter sets in the database to more closely match the measured optical response; and

iteratively evaluating a theoretical model to refine the optical response obtained by interpolation to more closely match the measured optical response.

12. (Original) A method as recited in claim 11 that further comprises the step of iteratively evaluating the theoretical model to generate the database.

13. (Original) A method as recited in claim 11 wherein the step of interpolating is performed without evaluating the theoretical model.

14. (Original) A method as recited in claim 11 wherein the database interpolation is performed using reduced multicubic interpolation.

15. (Currently Amended) A method of evaluating a sample comprising the steps of:

creating a database of pre-computed optical responses and corresponding sets of pre-computed measurement parameters of the sample;

optically inspecting the sample to generate an empirical optical response;

comparing the empirical optical response to the pre-computed optical responses stored in the database and selecting the closest match;

using the closest match, interpolating using the parameters sets of the database to generate an interpolated optical response; and; and

using the interpolated optical response as a starting point, iteratively evaluating a theoretical model corresponding to the sample to minimize the difference between theoretically generated optical responses and the empirical optical response to produce a best fit for the actual measurement parameters of the sample.

16. (Original) A method as recited in claim 15 that further comprises the step of iteratively evaluating the theoretical model to generate the database.

17. (Original) A method as recited in claim 15 wherein the interpolated optical response is generated without evaluating the theoretical model.

18. (Original) A method as recited in claim 15 wherein the interpolated optical response is generated using reduced multicubic interpolation.